Am. J. Epidemiol. 128 (1) 242 July, 1988



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## RE: "EFFECTS OF PASSIVE SMOKING IN THE MULTIPLE RISK FACTOR INTERVENTION TRIAL"

Based on the Multiple Risk Factor Intervention Trial data, Svendsen et al. (1) have reported a relative risk of 1.72 for death from any cause among male passive smokers (male nonsmokers married to a smoking wife vs. male nonsmoker married to a nonsmoking wife). This risk compares with a relative risk for male active smoking (male smokers vs. male nonsmokers) of 1.66, which we calculated from the Multiple Risk Factor Intervention Trial data (2).

To the other explanations that may be offered for this surprising comparison, we wish to add an alternative possibility that may not occur to those who are not predisposed to give cigarettes the benefit of the doubt. The effect measured by Svendsen et al. may be caused by stress rather than by passive exposure to cigarette smoke.

There is considerable evidence that psychologic stress is capable of increasing the risk of developing diseases that are major causes of death. Both Type A behavior and high levels of hostility have been shown in prospective studies of human populations to predict increased risk of coronary heart disease (3) and death due to all causes (4, 5). There is additional evidence from animal studies that behavioral stress and its physiologic concomitants promote the development of both cancer (6, 7) and coronary atherosclerosis (8).

As we have previously argued (9), there are substantial grounds for believing that nonsmoking spouses of smokers are subjected to stresses arising therefrom. While the health authorities, given their convictions, have no honorable alternative, it is nevertheless stressful to the nonsmoking spouse to be told constantly that the smoking spouse is "killing herself (or himself)" by smoking cigarettes. Repeated attempts to persuade the spouse to give up smoking would be a source of contention and their failure an additional source of stress.

Also, there is reason to believe that smokers are less supportive as spouses than nonsmokers, thus creating a stress-related risk for their mates. Current female smokers are nearly three times as likely to be divorced as women who have never smoked cigarettes (rate calculated from data in reference 10). In addition, it has been demonstrated from the Framingham Heart Study data (11) that occupations, ambition, and symptoms of anger among wives were more strongly related to their husbands' coronary health outcomes than the husbands' conventional "risk factors".

More generally, the inferences drawn by Svendsen et al. may be an example of the error potential in attributing a mortality difference between two groups of people to what is presumed by the investigators to be the only relevant average difference between them.

If there is merit in the foregoing, it may also be true that the scientific community has been incorrect in attributing to smoking the mortality rate differences so often reported for active cigarette smokers compared with nonsmokers. A hitherto undiscussed difference is that the constant admonitions that their smoking is "self-destructive" must also be stressful to the smoker, while cessation of smoking may have a placebo effect.

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*Editor's Note. In accordance with Journal policy, Dr. Svendsen et al. were given the opportunity to respond to this letter, but chose not to do so.*

## RE: "ENVIRONMENTAL AND BEHAVIORAL DETERMINANTS OF FASTING PLASMA GLUCOSE IN WOMEN: A MATCHED CO-TWIN ANALYSIS"

Over 45 years ago, Gesell (1) described the method of co-twin control, an experimental method that was applied to the study of child development. Since monozygotic co-twins share environment as children and are genetically identical, differences between treated and untreated co-twins were interpreted to result from treatment. This method was recently extended to continuous outcomes in observational studies (2, 3). The method compares associations in an unmatched sample to associations within twin pairs (matched) to identify associations that are independent of familial variables shared by co-twins. The matched analysis consists of a multivariate linear regression forced through a zero intercept with dependent and inde-

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